Abstract

Cost-effective processes and tools used therein are described that decontaminate sludge using remedial water in a closed and environmentally friendly system. Typical contaminants such as toxic metals, microorganisms, and toxic compounds are detoxified or destroyed by one or more remedial water treatments to sludge that is confined to the closed system. The closed system may comprise a covered rail road car, ISO container, or other large space into which the remedial water, and optionally, remedial gas, is applied by injection or other means. In a preferred embodiment, water is electrochemically activated at the site of use and injected through an array of pipes within the container. A large variety of other waters and combinations of water, and even air treatments are particularly useful in combination with the closed system for treating sludge. Sludges such as dredged material, human or animal waste, and soils or sediments, are particularly amenable to conversion by the materials and methods of the invention into a more beneficial end use product.